



## **AESTHETIC TENDENCIES IN THE ARCHITECTURAL AND LANDSCAPE DESIGN DRIVEN BY NATURAL SHAPES**

### **TENDENCJE ESTETYCZNE W PROJEKTOWANIU ARCHITEKTURY I KRAJOBRAZU NAPĘDZANE PRZEZ KSZTAŁTÓW NATURALNYCH**

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#### **STRESZCZENIE**

Klasyfikowane główne tendencje estetyczne w projektowaniu architektury i krajobrazu napędzane przez kształtów naturalnych. Określone główne metody nowoczesnego projektowania krajobrazu (lend-art, parkowa biorzeźba). Reprezentowane liczne prace związane z realizacją idei bioarchitektury, biourbanistyki, projektowania krajobrazu i lend-artu.

Słowa kluczowe: tendencje estetyczne w projektowaniu, napędzane przez kształtów naturalnych, bioarchitektura, biourbanistyka, projektowanie krajobrazu, lend-art.

#### **ABSTRACT**

There have been classified the main aesthetic tendencies in the architectural and landscape design driven by natural shapes. There were defined the main methods of modern landscape design (lend-art, park biosculpture). Numerous examples represent the works of architects and designers associated with the implementation of the idea of bioarchitecture, biourban planning, landscape design and lend-art.

Key words: aesthetic tendencies in design, driven by nature, bioarchitecture, biourban planning, landscape design, lend-art.

## INTRODUCTION

Today in the situation of industry growth and the loss of connection with natural environment it is extremely important to study the methods and trends of modern architectural, urban and landscape design which is based on nature's shapes and natural way of creation. Integration of objects of bioarchitecture, biourban planning, landscape design help to create a harmonious environment.

Theoretical and practical aspects in this field of research are working out by many scholars namely by L. Jones, T. Kazantseva, O. Kashchenko, N. Kryzhanivska, E. Lazarev, A. Lazarev, Y. Lebedev, G. Lynn, S. Migal, V. Mikhaylenko, H. Osychenko, F. Otto, I. Rechenberg, P. Schumacher, J. Senosiain, K. Yeang, J.K. Waters, J. Wines, E. Zabelina. Analysis of these works as well as works by masters - the famous leaders in bionic architectural, urban and landscape design – shows the need for further generalization in this field of research.

*The aim of the article* is to classify and characterize the main aesthetic tendencies in the architectural, urban and landscape design driven by natural shapes, also to represent the variety of works of masters associated with the implementation of the idea of bioarchitecture, biourban planning, landscape design and land-art.

## BASIC THEORY PART

The tendency of **architecture with natural shapes** with its smooth flowing volumes, consistency with the natural environment and use of natural materials was established by the architect of Modern style A. Gaudi. The principles of organic architecture, formulated in the 19<sup>th</sup> century by L. Sullivan, in the 1<sup>st</sup> half of the 20<sup>th</sup> century had been implemented by F. Wright. His "Fallingwater" residence has been acclaimed to be the best private house of the 20<sup>th</sup> century thanks to the integration into natural environment and implementation of natural materials.

Asymmetry and irregularity of architectural shapes have become a feature of the work of F. Hundertwasser. In his Vienna house architect realizes his ideals of beauty: the absence of straight lines, rich polychromatic facades (colored majolica tiles and plaster), diversity of vegetation, different configuration of window and door openings.

J. Senosiain continues natural tendency in architecture, which is manifested in direct imitation of living organisms' shapes (snail, snake, whale, flowers, trees etc.). His views Senosiain had formulated in the "Bioarchitecture", declaring that we have to build small houses which correspond to its owner's size, which are located in natural surroundings, using natural materials of local origin. So in the construction of his buildings the architect uses organic reinforced cement, which associates with the natural process of creation of the shell that is constructed and strengthened by the snail because of its ability to get lime from water and to set aside small particles on the edges and inside the shell. Also reinforced cement has the necessary flexibility, which allows creating any design configuration, and has the high strength, allowing producing thin architectural elements (about 5 cm) (fig. 1).

Flowing natural shapes characterize a lot of outstanding architectural works such as Bubble House (architect A. Lovag); Metropol Parasol in Seville (J. Mayer H. Architects).

Often the use of natural shapes is connected also with philosophy or semantic aspect. Thus, Crescent Moon Tower (Transparent House) represents the high level of technological and economic development of Dubai and the relationship with the tradition of the Islamic world (fig. 2). The architectural image of the Museum of Fine Arts of Islam is expressed in geomorphology relief that imitates the desert landscape. Architecture of House of Worship in India (architect F. Sahba) stylizes giant lotus flower - symbol of purity in Buddhism. The new stadium in Beijing is built in the shape of the nest as a

symbol of new life, the good and the cradle of new records. The Grand Lisboa Hotel in Macau has become the symbol of a luxury and entertainment because of its pineapple shape (fig. 3-5).

Bionic approach has been implemented in egg-shaped houses which are located in natural surroundings and which serve as a place for solitude and relaxation. These are the Free Spirit Spheres (architect T. Chadli) and HemLoft in Canada (architect J. Allen).

Animalistic tendencies characterize a number of sites that are trying to stand out for its architecture from the familiar environment. It can be as homes or cafes, and shops or business offices, thus promoting their products. These are the houses in the form of strawberries, mushrooms, trees, pumpkins, snails and more (fig. 5, 6).



Fig. 1. The Mexican Whale House. Source: <http://biomimeticdesign.files.wordpress.com>



Fig. 2. Crescent Moon Tower. Source: <http://www.differentdesign.it>



Fig. 3. Lotus Temple. Source: <http://www.bahaipr.org>



Fig. 4. "Bird's nest" stadium. Source: <http://www.arcspace.com>



Fig. 5. The Grand Lisboa Hotel. Source: <http://farm5.static.flickr.com>



Fig. 6. Snail House. Source: <http://static.panoramio.com>

**Blob architecture** is characterized by smooth and soft shapes connected in one volume. Unconventional and non-geometrical facade of the buildings becomes possible by the introduction of automated design processes (fig. 7). The concept of blob architecture belongs to Greg Lynn, who interpreted the shape of the building as something soft and rounded similar to the blob of alien living substance, ready to absorb everything around. Greg Lynn has worked out a so-called Embryological House - structure that independently develops from primitive dwelling, adapting to the environment conditions.

The buildings in this style include The Kunsthaus Graz (P. Cook, C. Fournier), Experience Music Project in Seattle, The Selfridges store in Birmingham (Future Systems) (fig. 8), London City Hall (H. Foster), Golden Terraces in Warsaw and the Louis Vuitton Foundation (F. Gehry).



Fig. 7. Chicago Cloud Gate. Source: <http://www.mondoexplorer.com>



Fig. 8. The Selfridges store in Birmingham. Source: <http://upload.wikimedia.org>

**Ecological skyscrapers** are the buildings that use natural energy (solar, wind, wave energy) and have integrated landscape area (terraces, floors, roofs). One of the most striking examples is the 30 St. Mary Axe Tower (architect N. Foster) (fig. 9). Due to the use of solar lighting and natural ventilation 180 meters building uses half of the energy than comparable buildings. Designed by Italian architect D. Fisher the 80-storey tower is the dynamic skyscraper. All the stores rotate by voice command of inhabitants. The purpose of the rotation is equal insolation of all apartments and appropriate use of solar and wind energy (fig. 10). The most beautiful high-rise building in the world is considered to be the Aqua Tower in Chicago (Studio Gang Architects). Wavy facades surfaces that work as sunscreen shelters also are associated with the texture of the limestone rocks of Michigan Lake and remind about environmental danger of washing out of the coast (fig. 11). The special features of this building are seismic stability, energy-saving lighting and systems for water collection.



Fig. 9. The 30 St. Mary Axe. Source: <http://upload.wikimedia.org>



Fig. 10. Dynamic Tower. Source: <http://inhabitat.com>



In ecological building a leadership position China occupies because of the significant lack of natural resources and environmental pollution. Pearl River Tower (AS+G.G firm) meets all the new trends in eco-construction. The skyscraper facade in the shape of vertical wave gently rounds in front of each channel with wind turbines. The openings of the building enhance the wind speed is 2.5 times, while the wind load on the facade reduces. Built-in floor cooling fluid circulation system avoids formation of conditioner network and accordingly increases the effective area of the building. Climate humidity has led to the introduction of passive dehumidification system in the ventilating trunk. Dry hot air will flow from the channels arranged between double glasses with anti-reflective coating of southern facade. Besides glass ventilation will reduce total heating of the building. In addition to the wind turbines building façade is covered by photovoltaic panels that capture solar energy and reduce heat.

The size and nature of some skyscrapers equates them to Ecopolises. So, equipped with solar and wind panels 132- story Dragonfly building (architect V. Callebaut) is a vertical village with farms, offices, laboratories and housing. The climate is supported by natural ventilation and plants evaporation (fig. 12). Another project Hydrogenase by V. Callebaut is associated with leaves or steams, where in addition to offices, residential and industrial centers are gardens and farms where green microalgae produce bio hydrogen. Such buildings can be combined into the eco poleis that can float as near the land so at sea (fig. 13).



Fig. 11. Aqua skyscraper. Source: <http://upload.wikimedia.org>

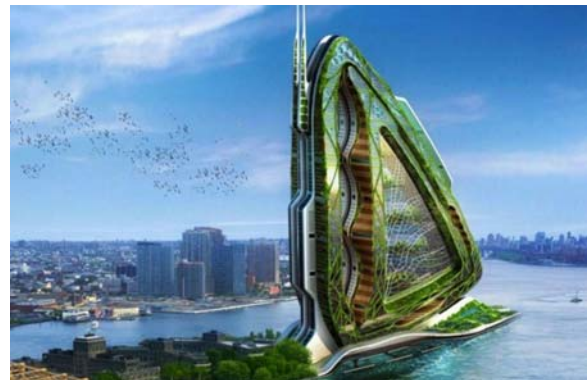


Fig. 12. Dragonfly Farm. Source: <http://wordlesstech.com>

Skyscraper Competition organized by eVolo Architecture is very important for the development of the concepts of eco-skyscrapers. Represented buildings are not only have to be original and technically appropriate, but also energy efficient and environmentally friendly. So, the project Symbiotic Interlock (architect D. Park) is a multifunctional application to existing skyscrapers that have formed to enrich the environment and to unit skyscrapers merge into a single network. At the corners of the already built skyscrapers four types of blocks are mounted vertically: I - vertical garden, II - air bridges, III - infrastructure (shops, restaurants, museums), IV - technical (department for wind turbines).

The Coastal fog-harvesting tower for Chile is an example of projects with clearly highlighted function. One such tower that collects and purifies moisture from the ocean can collect at least 20 thousand liters of water per day. Alternative solution of eco skyscraper is presented by Sarly Adre Bin Sarkum bureau in the project of "Water-Scrapper" floating building that develops not up but down. This "waterscraper" is environmentally safe and will produce its own electricity (using wind and solar wave power) and food (through agricultural production, aquaculture and hydroponic techniques). On the surface of "waterscraper" are a small forest and the space on the

lower level for its inhabitants living and working. It's optimal when ecological buildings also represent the traditions of their regions, such as Namaste Tower in Mumbai (fig. 14). The form of the building is inspired by traditional Indian greeting "Namaste" in which hands are folded together, and the ornament on the skyscraper facades referred to the Indian painting by henna on the skin.



Fig. 13. Hydrogenase. Source: <http://4.bp.blogspot.com>



Fig. 14. Namaste Tower. Source: <http://traavelin.com>

**Bionic urban planning** includes two areas - parametricism and futurism. Parametricism is a new trend in architecture and urban planning associated with ideas of digital design and development of digital technology. Parametricism as a theory don't approve regular geometric shapes and repetition of elements according to urban planning principles of Le Corbusier who was fond of right angles and straight lines, the order of the Roman cities which is opposed to the picturesque medieval towns irregularity. Instead, the F. Otto study on analogue models shows that natural urban planning structure can be analyzed by the internal logic of the concepts and grouped and classified as the typical settlement patterns. Simultaneously, the parametricism used scripting (Mel-script or Rhino-script) and parametric modeling (GC or DP). The peculiarities of urban planning on the base of parametric method had been studied in a three-year research in the laboratory of the Architectural Association School of Architecture (AADRL) - Parametric Urbanism. The results of this research are demonstrated in a series of master plans by studio Zaha Hadid Architect, who won a number of international urban planning competitions for Singapore, Beijing and Istanbul (fig. 15, 16).

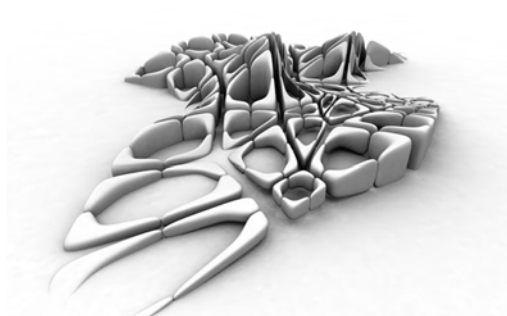


Fig. 15. Kartal-Pendik Masterplan. Source: <http://www.patrikschumacher.com>



Fig 16. Galaxy soho. Source: <http://www.thenewsgallery.com>

Development of **futurism** in urban planning is mainly working out in the architectural competitions of the future cities. For example, the Iwamoto Scott architects team offered

for San Francisco Hydro-Net project, which is a network of underground arteries for water and electricity collection and distribution. There have been planned to create areas with algae ponds for hydrogen creation, and around them - residential areas. Hydrogen fuel will be distributed in the nanotubes within the walls of buildings structures. This fuel quantity is enough to provide life support systems of buildings and car park of the city.

To help people to survive in conditions of the global warming, air, water and soil pollution, the constant population growth, architects are constantly creating different designs of autonomous communities. One of the most well-known projects is the Venus project (J. Fresco), which involves the relocation of a large number of people in the oceans and seas. Huge floating city, according to the authors' conception, will drift through the water, using the resources of the ocean, and trying to live in harmony with nature. Several ways to supply the energy for such complexes namely including solar, wind and wave energy had been worked out. Another project is the floating Lilypad - city in the shape of water lilies for 50 000 inhabitants (architect V. Callebaut) (fig. 17).

A number of futuristic projects are devoted to solving the problem of the lack of space and gas concentration in metropolitan areas and to creation of green areas located above noise and smog. There was a network of aerial lifts established above the city, as in Sky-Terra Towers (architect J. Borek-Clement) (fig. 18) or as a system of futuristic skyscrapers above Central London by C.Toshkov.



Fig. 17. Lilypad. Source:  
<http://www.eikongraphia.com>



Fig. 18. Sky-Terra Towers. Source:  
<http://www.inhabitat.com>

Perhaps the only realized ideal city project is "City of Dawn" in Auroville (city for 5 thousand inhabitants), which is a joint project of UNESCO and Indian Government. The aim here is desert land reclamation and landscaping. The city is divided into districts - Cultural, Residential, Industrial and International and outside must be surrounded by a green belt.

**"Earth" architecture.** The term «Earth houses», as well as the buildings, was first created by P. Vetsh who built about fifty "earth houses" in Switzerland and Germany, for example complex Nine House in Dietikon (fig. 19). These houses haven't got right angles; they are optimal in terms of area and energy efficiency. Spirit of Gaudi's Art Nouveau architecture occurs in the flowing lines of buildings, which are built from special concrete. The unique architecture of the so-called "Earth houses" protects them from storms. They cannot be separated from the ground or destroyed by high winds. The project of "Earth house" is based on the idea of dwelling construction in harmony with nature, its natural structure. The concept of this building allows using the ground as insulation that protects against rain, cold, wind and other negative factors. The construction of such a building is environmentally friendly project because it does not affect the natural balance in the environment and is less energy intensive. Earth houses concept gives the possibility of



natural landscape use as an advantage rather than disadvantage in housing construction in hilly areas with difficult terrain where you need maximum preservation of the natural environment.

Among the “earth houses” for the original three-dimensional solution can be identified “The Pit” (architect P. Noever), the Flintstones House, the Organic House (J. Senosiain) (fig. 21), “The Earth House” (Jolson Architecture Interiors), “Brunsell Residence” (O. Bowman), “Edgeland House” (Bercy Chen Studio), OUTrial House (Promes KWK), Villa Price (Bart Prin). The principles of terraced building and green sloping roofs which are integrated into the environment are used in buildings of F. Hundertwasser, particularly in Hotel Therme Rogner Bad Blumau Kunsthaus.



Fig. 19. Nine Houses. Source: <http://www.flor.com>



Fig. 20. The Organic House. Source: <http://organicarchitecture.weebly.com>

To “earth houses” group also belong complexes with spherical volumes that seem to grow out of the ground and are associated with hilly landscape. This group of buildings includes The Bubble House (architect W. Nicholson) and orangeries “Eden” in Great Britain (architect N. Grimshaw).

**“Green architecture”.** Today in many cities of the world buildings with greened roofs and walls, and vertical farms that provide urban residents with food and do not occupy large areas of land have been constructed. One of the founders of “green architecture” is E. Ambasz, in whose opinion the whole earth, which was used for the building construction should be returned to society through the creation of special green areas that are seamlessly integrated part of each building. For example, his Fukuoka Prefectural International Hall is a huge construction which occupies area of over 100,000 square meters, which becomes the green zone in the form of hanging gardens (fig. 21).

One of the outstanding projects of the “green” design is considered Bosco Verticale (Boeri Studio) for Milan. One of the main goals of the project was to minimize damage which was caused to nature as a result of rapid Milan urbanization. On two skyscrapers’ horizontal surfaces must be planted so many plants that is equal to an area of 10,000 square meters of ordinary forest. The diverse vegetation of these buildings will help to create an optimal microclimate, to absorb carbon, to produce oxygen, to stop the dust and protect from excess sunlight and city noise. Among other famous examples of green architecture one could name the company's headquarters Lucasfilm (bureau Aedas) in Singapore; tower “Belvedere” (Bureau Fat) in London; Technological University in Singapore (fig. 22); School of the Arts (Bureau WOHA) in Singapore; “Dancing Apartments” (Unsangdong Architects) for Korea. In the last example vertical skyscraper surface looks like as the rock gardens because of S-shaped transition of the wall. It



promotes better insulation and allows creating harmonious neighborhood according to people hobbies.



Fig. 21. Fukuoka Prefectural International Hall.  
Source: <http://www.greenroofs.com>



Fig. 22. Technological University in Singapore.  
Source: <http://images.businessweek.com>

One of the leading designers of **vertical gardens** is a French botanist and artist P. Blanc. He uses only the foliage that grows on rocks and does not require soil. P. Blanc had worked out the special building's wall with mounted metal frame to which are attached polymer layers, like cave moss that support plant roots. Since 1988, Blanc has created dozens of these "botanical" tapestries in public and private places around the world, including the administrative center of the Musée du Quai Branly in Paris (fig. 23).

Green roofs considered to be much more common in the modern world. In some Scandinavian countries greenery on rooftops is an old tradition. Particularly in Norway residents sod roofs protect from frost and wind (fig. 24). According to statistics, today in Germany about 10% of all roofs are green, for example one of the first such buildings is GENO Haus in Stuttgart.



Fig. 23. Musée du Quai Branly in Paris. Source: <http://inhabitat.com/vertical-gardens-by-patrick-blanc>



Fig. 24. Norway green roofs. Source: <http://calculatedmess.wordpress.com>

**Landforming.** One of the most prominent representatives of this trend is considered C. Jencks, who has developed a number of projects connected with the transition of large amounts of ground to create three-dimensional compositions. Being in the middle of the composition observer can move, perceiving new aspects of the author's idea. Sometimes these compositions are best seen from the bird fly, as The Lady of the North garden, or Northumberlandia, which is the world's largest human figure, once used in landscape design (fig. 25). Another famous work of C. Jencks is called The Garden of cosmic

speculations where the main part of the garden is a huge staircase with 25 spans, meaning the most important stages of cosmic history.

A sort of landform realized in flat style is agricultural painting or the "Earthworks" as a representative of this trend S. Herd calls his work. This landscape art is to create monumental figures in the fields, which are done by digging and plowing land and planting various plants. Large-scale paintings are not as long-lasting as painting on canvas, but they are part of the rural landscape (fig. 26). To estimate the picture, the author has to fly highly by plane or a balloon, and, where appropriate, to correct the mistakes and to dig the earth again. Some representatives of agricultural painting, as Artfield Company, create famous brand advertising just to view them from the aircraft.



Fig. 25. Northumberlandia. Source: <http://www.northeastlifemag.co.uk>



Fig. 26. Earthwork. Source: <http://s1.hubimg.com>

**Kinetic gardens** are referred to the kinetic art, based on spatial-dynamic experiments connected with the effects of the real movement of the artwork or its component. Water, wind and hidden mechanisms are used to create the effect of motion. Examples of kinetic gardens is "Wrong Garden" at Chelsea (J. Dyson), which creates the illusion of water circulation upward (fig. 27), and the "Joyful Tree" installation, mounted on rotated platform.

**Installations gardens** belong to the landscape compositions created as well with objects, materials and industrial products as well with natural objects. Between art installation and landscaping is the design of firm Swon of Montreal, which combines natural (plant, water) and hand-made elements of glass and plastic.

Quite common are light landscape installations. For example, the Botanical Garden of Atlanta is decorated by dozens of flaming topiary shapes, which shades and color intensity are simultaneously changing with the music. Another project "Field of Light" (B. Munro) is lit at night with the help of colorful LED lights and fiber optical projectors. Observation of the water surface, illuminated by sunlight, was the impetus for creating art project CDSea (B. Munro), which is a large hilly surface, covered with the CD-ROMs (fig. 28).

The holes in the ground or rocks are typical handwriting of the company «LAND-I Archiculture», in particular in the installation garden "Shadow", which was associated with archaeological sites, recalling the past.

L. Turta plastic installation created with disposable utensils should draw attention to the excessive man control and the loss of connection with nature ("The Garden of Angels"). Network installations by S. Preschoux is an attempt of graphic interpretation of the landscape installations "Man vs. Machine", which protests against industrial technology and appreciates only creativity with manual labor.





Fig. 27. Wrong Garden. Source:  
<http://forum.theorchidsource.com>



Fig. 28. CD-Sea. Source:  
<http://news.bbc.co.uk>

**Gardens and parks.** For many years, French gardens of Marqueyssac (Jardins de Marqueyssac) attract nature lovers and evergreens topiary connoisseurs. The length of the Marqueyssac garden is over 6 km of figure labyrinth in which 150 000 old boxwood trees shaped like lambs on the hills, garden sculptures, small architectural forms grow. The meandering lines of the labyrinth are associated with surrounding hills of the Dordogne valley.

The Alnwick Garden in Northumberland in England is interesting because on its example it was possible to restore grand formal gardens of the past while creating a democratic public park for family entertainment with well implemented theme of water (the Great Cascade, 123 fountains, Serpent Garden, Ornamental Garden) (fig. 29). Flower Garden of the Grand Cascade includes over 65 thousand plants. A special attraction is the Poison Garden, which includes more than 50 poisonous and narcotic plants, planted in cages. A garden is designed to attract people's attention to the loss of life through drugs.

Tree Museum was created by tree collector E. Enea in order to share his experiences with the audience and to focus attention that people should take care of trees. This garden-museum is divided into individual "rooms" for each species and specific microclimate conditions. Dubai Miracle Garden which is the largest in the world affects with the collection of plants and the creativity of landscape design. This garden which is decorated with unusual flowerbeds, heart-shaped arches, 10-meter flower pyramids and columns contains a range of 45 million flowers (fig. 30). First of all, for environmental needs designers from Vincent Callebaut Architects created a garden-amphibian «Physalia», combining natural processes of modern biotechnology to purify the water in the rivers. Through the use of clean sorts of energy, this building will be able to provide the power required for it's movement and major systems functioning. There will be placed several zones called "gardens" (water garden, air garden, fire garden, land garden).



Fig. 29. Alnwick Garden. Source:  
<http://3.bp.blogspot.com>



Fig. 30. Dubai Miracle Garden. Source:  
<http://miraclegardendubai.net>

A kind of eco-design trend is “**spyware greening**” whose adherents believe that by using of “seed bombs” they are struggling with vandalism. People by themselves are planting plants in broken landscaping elements, cracks or potholes in the road.

**Land art** - a new art direction, where an artist uses stones, earth, leaves, branches, etc instead of canvas, dyes, clay or plaster. Because of environmental factors all works are rapidly destroyed, so to evaluate the work of artists, most of people can only photograph. A good representative of this trend is S. Meyer, or Gambastyle. Among his works is square web, Sunshine of dandelions and leaves, spirals of stones, sand, leaves, and moss covered stump in the form of a spider (fig. 31). W. Mason works of art are characterized by less scale, the lack of sculptural approach and use of leaves, snow, drops to receive patterns in the natural environment. F. Infante known for his time and-space installations in nature, created with aerial structures of filaments and mirrors.

In the installation "Pictures of trees" T. Nouels serves as a director. He ties pens to branches, put canvas under them waiting until the wind draw patterns. Kind of monumental land art is painting on earth which is not preserved for a long time, so should be photographed to be appreciated by the audience. Such 3D patterns are made on snow by S. Beck (fig. 32), on beaches by A. Amador, T. Plant, in deserts by D.Denavan.



Fig. 31. Land Art by S. Meyer. Source: <http://designland.in.ua>

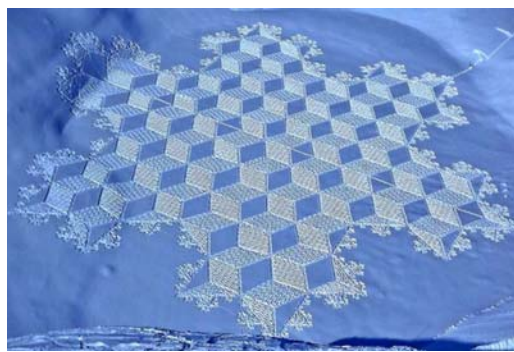


Fig. 32. Snow Art by S. Beck. Source: <http://artcocktail.mallforarts.com>

**Bionic park sculpture** generally can be divided into two groups. The first consists of works in which the natural shapes of plants are modified (topiary landscaping, arborsculpture). In the second group natural forms are imitated with artificial means.

To the top ten best topiary parks in the world belongs the Topiary Park in Columbus, where picture of J.P. Seurat “A Sunday Afternoon on the Island of La Grande Jatte” had been reproduced (fig. 33). A peculiar kind of this trend is green sculpture, which solid frame is completely covered with moss or grass like “Sleeping Beauty” in the gardens of Cornwall. These sculptures are characterized with highly realistic transmission of natural forms as the “Green elephants” that allows them to fit perfectly in the natural environment.

**Arbosculpture** - the art of creating sculptures, furniture, buildings with living trees that can last 8-10 years. The main feature of this type of biodesign is that trees continue to live and grow without losing the designed form. One of the first works in this direction is chair grown by D. Krabsaka. A prominent representative of this trend is considered to be A. Erlandson, author of “The Tree Circus”. The other master, A. Vichula, believed that in the ideal house as well furniture so framework should grow.

Another type of biosculpture is sculpture from natural materials (branches, stumps, straw, etc.) that is part of a park or garden, such as straw sculptures of C. Sadler or small architecture forms from branches of P. Dougherty (fig. 34). Some garden sculptures



imitate natural forms though they are not made of natural materials such as sculpture "Lights" (H. Williams), made of colored crayons.



Fig. 33. Topiary Park in Columbus. Source: <http://topiarygarden.info>



Fig. 34. Arbosculpture. Source: <http://www.stickwork.net/featured/>

## RESUME

1. The main aesthetic tendencies in the architectural design driven by natural shapes have been classified and described. They are architecture with natural shapes, organic architecture, blob architecture, ecological skyscrapers, parametricism, futurism, "earth" architecture, "green" architecture, landforming, kinetic gardens etc. The modern techniques of landscape design of gardens and parks have been characterized. The peculiarities of land art and bionic park sculpture have been highlighted.

2. The meaning of each trend have been clarified on examples, the work of architects and designers associated with the implementation of bioarchitecture - from A. Gaudi to N. Foster and Z. Hadid have been examined.

3. There have been classified such aesthetic tendencies in bioarchitecture: a) the preservation of national traditions by using local flora, fauna, landscape or historic attributes; b) the literal imitation of natural forms (often with increasing scale) for advertising or for enhancing the attractiveness of the building; c) use of membranes tectonic forms within the concept of dwelling as a refuge and a place for solitude. Ecological skyscrapers have to use and accumulate natural energy of wind, water, solar, photosynthesis, etc. with the help of technical devices, achievements in nanobionic and optimal form of the building.

5. The "Earth" buildings have been classified into groups: a) underground with overhead lighting; b) multi-leveled or terraced; c) land with low spherical structures. There have been selected methods used in "green" architecture: a) planting of shrubs, trees and herbs on balconies; b) vertical garden; c) the landscaping of the roof.

7. Aesthetic tendencies in biosculpture can be divided into groups: a) with natural materials (topiary, arbosculpture); b) imitation of natural shapes by synthetic materials.

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